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NOTES ON SOME INSECTS OF NOVA SCOTIA AND CANADA.

BY FRANCIS WALKER, F. L. S., LONDON, ENGLAND.

The following communication is introductory to a few remarks on the Nova Scotian and Canadian Insects which I have received through the kindness of J. M. Jones, Esq., W. Saunders, Esq., and Prof. Croft.

The study of the geographical distribution of Insects has become more interesting by the difference of opinion as to the origin and diffusion of species. The insects of separate arctic regions have a great mutual resemblance, and the difference between them increases in the successive concentric circles from the above regions towards the equator. It has been said that the advance of the glacial period was accompanied by the migration of insects southward, and that the present distribution of insects was effected by the prevalance of this epoch and by the succeeding temperate epoch. During the diminution of the glacial, the arctic species of the present time migrated northward or ascended the mountains, and thus caused the partial identity of the insects of the Alps with those of the North. The similarity of insects of widely separated regions, such as North Europe, North America, and North-east Asia, chiefly consists in the arctic or northern forms; the difference between them is found in the species that have advanced northward in later times. Some species inhabit both the South and the North, and occur in Hindostan as well as in North Europe, but the rest appear either to have wholly continued in the South, or to have wholly migrated thence to the North. The insect-fauna of North America appears in two aspects—the northern aspect, which closely and in some cases wholly resembles that of North Europe; and the southern aspect, which is very different from that of North Europe, and consists of species that have migrated from the South as far as Canada.

The Diptera in the following list are natives of Nova Scotia, and those marked thus * also inhabit Europe.

MYCETOPHILIDÆ.

MYCETOPHILA propinqua, *Walk.*
contigua, *Walk.*
læta, *Walk.*
SCIARA præcipua, *Walk.*

CULICIDÆ.

CULEX stimulans, *Walk.*
provocans, *Walk.*

CHIRONOMIDÆ.

CHIRONOMUS unicolor, *Walk.*

TIPULIDÆ.

PEDICIA albivitta, *Walk.*
contermina, *Walk.*
LIMNOBIA Argus, *Say.*
badia, *Walk.*
TIPULA triplex, *Walk.*
duplex, *Walk.*
flavicans, *Fabr.*
borealis, *Walk.*
maculipennis, *Say.*
resurgens, *Walk.*
frigida, *Walk.*
alterna, *Walk.*
BITTACOMORPHA clavipes, *Fabr.*
TRICHOCERA bimacula, *Walk.*

BIBIONIDÆ.

PENTHETRIA atra, *Macq.*
BIBIO xanthopus, *Wied.*
humeralis, *Walk.*
scita, *Walk.*
vestita, *Walk.*
gracilis, *Walker.*

STRATIOMIDÆ.

STRATIOMYS norma, *Wied.*
ODONTOMYIA intermedia, *Wied.*
vertebrata, *Say.*
CHRYSOMYIA viridis, *Say.*

TABANIDÆ.

TABANUS calens, *Linn.*
flavipes? *Wied.*
affinis, *Kirby* (frontalis, *Walk*).
inscitus, *Walk* (bis lectum)
comes, *Walk.*
gracilis, *Wied.*
marginalis, *Fabr.*
simulans, *Walk.*
CHRYSOPS vittatus, *Wied.*
mœrens, *Walk.*
carbonarius, *Walk.*

ASILIDÆ.

LAPHRIA posticata, *Say.*
thoracica, *Fabr.*
sericea, *Say.*
sacrator, *Walk.*
Æatus, *Walk.*
DASYPOGON sexfasciatus, *Say.*
argenteus, *Say.*
Falto, *Walk.*
Lutatius, *Walk.*
ASILUS apicalis, *Wied.*
Lecythus, *Walk.*
Sadyates = Abilux, *Walk.*

LEPTIDÆ.

LEPTIS mystacea, *Macq.*
CHRYSOPILA quadrata, *Say.*
fumipennis, *Say.*
proxima, *Walk.*
reflexa, *Walk.*

BOMBYLIDÆ.

THEREVA vicina, *Walk.*
conspicua, *Walk.*
senex, *Walk.*
ANTHRAX tegminipennis, *Say.*
Œdipus, *Fabr.*
fascipennis, *Say.*

ANTHRAX fulviana, *Say.*
Bastardi, *Macq.*
lateralis, *Say.*
vestita, *Walk.*
BOMBYLIUS pygmæus, *Fabr.*
*major, *Linn.*

EMPIDÆ.

EMPIS Ollius, *Walk.*
colonica, *Walk.*

SYRPHIDÆ.

SYRITTA proxima, *Say.*
XYLOTA ejuncida, *Say.*
Libo, *Walk.*
RHINGIA nasica, *Say.*
*HELOPHILUS pendulus, *Linn.*
Latro, *Barnston.*
MERODON curvipes, *Wied.*
morosus, *Walk.*
SERICOMYIA militaris, *Barnston.*
filia, *Walk.*
ERISTALIS nebulosus, *Barnston.*
transversus, *Wied.*
vinetorum, *Fabr.*
flavipes, *Barnston.*
lateralis, *Walk.*
*SYRPHUS Ribesii, *Linn.*
*MELITHRIPTUS Menthastri, *Linn.*
*hieroglyphicus, *Meig.*

DOLICHOPIDÆ.

PSILOPUS nigrofemoratus, *Mss.*
albicoxa.
MEDETORUS albiflorens, *Walk.*
DOLICHOPUS affinis, *Hal.*

CONOPIDÆ.

CONOPS sagittaria, *Say.*

MYOPIDÆ.

MYOPA vicaria, *Walk.*

OESTRIDÆ.

CUTEREBRA horripilum, *Wied.*
OESTRUS supplens, *Walk.*
*GASTRUS Equi, *Fabr.*
subjacens, *Walk.*

TACHINIDÆ.

GYMNOSOMA par, *Walk.*
occidua, *Walk.*
OCYPTERA Dosiades, *Walk.*
ECHINOMYIA hystrix, *Fabr.*
algens, *Wied.*
florum, *Barnston.*
finitima, *Walk.*
signifera, *Walk.*
decisa, *Walk.*
candens, *Walk.*
Anaxias, *Walk.*
iterans, *Walk.*
TACHINA Ampelus, *Walk.*
Pyste, *Walk.*
Panaetius, *Walk.*
Mella, *Walk.*
Theutis, *Walk.*
prisca, *Walk.*
Pansa, *Walk.*
violenta, *Walk.*
irrequieta, *Walk.*
GONIA Philadelphica, *Macq.*

MUSCIDÆ.

DEXIA (Estheria Desv.) abdominalis, *Desv.*
(Estheria Desv.) tibialis, *Desv.*
Ogoa, *Walk.*
SARCOPHAGA plinthopyga, *Wied.*
*hæmorrhoidalis, *Fall.*
avida, *Walk.*
rabida, *Walk.*
acerba, *Walk.*
vigil, *Walk.*
MESEMBRINA Latreillii, *Desv.*
CALLIPHORA vicina, *Desv.*
*erythrocephala, *Meig.*
viridescens, *Desv.*
*LUCILIA cornicina, *Fabr.*
*illustris, *Meig.*

*Musca corvina, *Fabr.*
*vespillo, *Meig.*
*Aptoneura meditabunda, *Fabr.*
*stabulans, *Fall.*
Stomoxys ? Cybira, *Walk.*

ANTHOMYZIDÆ.

Anthomyia Apina, *Walk.*
Barpana, *Walk.*
Narina, *Walk.*
Luteva, *Walk.*
Bysia, *Walk.*
Troëne, *Walk.*
Æmene, *Walk.*
Alcathoe, *Walk.*
Lysinoe, *Walk.*
Ausoba, *Walk.*
Anthomyia Signia, *Walk.*
Geldria, *Walk.*
Donuca, *Walk.*
Brixia, *Walk.*
Viana, *Walk.*
Isura, *Walk.*
Anthomyia determinata, *Walk.*
Opalia, *Walk.* leucostoma ? *Fall.*

HELOMYZIDÆ.

*Scatophaga stercoraria, *Linn.*
*squalida, *Merg.*
pubescens, *Barnston.*
intermedia, *Walk.*
*Cælopa sciomyzina ? *Hal.*
Actora ferruginea, *Walk.*
Helomyza tincta, *Walk.*
*Heteromyza buccata, *Fall.*
Blepharipiera fasciata, *Walk.*
*Tetanocera elata, *Fabr.*
Dryomyza convergens, *Walk.*

LAUXANIDÆ.

*Lauxania cylindricornis, *Fabr.*
*Elisoe, *Wied.*
*lupulina, *Fabr.*
Palloptera Philadelphica, *Macq.*

GEOMYZIDÆ.

*Drosophila cellaris, *Linn.*

LIST OF LEPIDOPTERA TAKEN AT QUEBEC.

BY G. J. BOWLES.

On page 95 of Volume II. of the Canadian Entomologist, I gave a list of the Diurnal Lepidoptera so far taken at Quebec. I now add the Hererocera as far as the Bombycidæ,,availing myself of the latest revision of the species by Dr. Packard and Mr. Grote. It is to be hoped that the researches of these eminent Entomologists have placed the nomenclature and grouping of these moths on a permanent basis.

SPHINGINA.—Sesiadæ.

1. *Sesia diffinis*, Boisduval. Rare. June.

2. *Hæmorrhagia thysbe*, Fab. (*Sesia palasgus*, Cramer). Common in June.

3. *Hæmorrhagia gracilis*, Grote & Rob. Described from a specimen captured by me in June, 1865 (Proc. E. S. Phil. V. 175). Its

habitat has been erroneously stated by them to be London, Ont., owing to their having received the moth from Mr. Saunders. (See page 10, Vol. I., CAN. ENT.) I have not met with the species since.

SPHINGIDÆ.

Amphion nessus, Cramer. Not uncommon. July.

Deilephila chamænerii, Harris. Very common some seasons, and appears in June, at the time the lilac is in bloom, of which it is very fond. A larva which, I think, produces this species, feeds on Fuschias, and on *Clarkia rosea*. I took four of them this year on the latter plant in my garden. They have changed to pupæ just below the surface of the ground. The caterpillars were of a dull olive green colour, with round cream-coloured spots in a row on each side, and a red caudal horn. Its native food-plant is unknown to me.*

Otus cherilus, Cramer. (*Darapsa cherilus*). Rare. June.

Sphinx chersis, Hubner. (*Sphinx cinerea*, Harris). Rare. June or July.

Sphinx Kalmiæ, Abbott & Smith. Not uncommon. June or July. I have taken the larva on lilac, also on *Fraxinus sambucifolia*.

Sphinx drupiferarum, Abbott & Smith. Not uncommon. June. Larva taken last year on plum.

Sphinx gordius, Cramer. Uncommon. June.

Daremma undulosa, Walker. Commonly known as *Ceratomia repentinus*, Clemens. Not uncommon. June or July. (See Vol. I., CAN. ENT., page 17).

Ceratomia amyntor, Hubner. (*Ceratomia quadricornis* Harris). For two or three years in succession I obtained the full grown larva of this species, on the 25th and 26th August, from Basswood trees near the Anglican Cathedral, Quebec, but have seen none for several seasons past. It appears in June, and may be considered rare.

Ellema Harrisii, Clemens. Uncommon. June or July.

Smerinthus modesta, Harris. Very rare.

Smerinthus excæcatus, Abbott & Smith. Not uncommon. June or July.

Smerinthus geminatus, Say. Not uncommon. June or July.

ÆGERIADÆ.

Trochilium tipuliformis, Harris. Very common on red and black currant. July.

* The Editor mentions having captured this species at Sault Ste. Marie in middle of August. (Page 83 of this volume.)

I have three species of *Trochilium*, which are still unnamed.

No. 1 answers well to the description of the male of *T. exitiosa*, Say, but unless its larva lives in some other tree than the peach or cherry, it cannot be this insect, as these fruit trees are not cultivated in the Quebec region. This species is rare.

No. 2 may be the *Trochilium acerni* of Clemens, described in Morris' Synopsis, page 330. It is an uncommon insect. The "Northern States" is given as its habitat by Clemens.

No. 3. This Ægerian is perhaps the *Trochilium pyramidalis* of Walker (C. B. M., VIII. 40) described on page 331 of Morris' Synopsis, though the locality given there is far north of Quebec. It is a rare species.

Thyris maculata, Harris. Very rare. June.

ZYGÆNIDÆ.

Alypia Langtonii, Couper. Taken by him and described in the CANADIAN NATURALIST for 1865, page 64. Not uncommon.

Eudryas grata, Fab. This moth is abundant some seasons. In 1868 I saw them in large numbers on *hops*, in a small garden. No grape-vines were in the vicinity. This year I found numerous larvæ on wild grape vines.

Ctenucha virginica, Charpentier. Common.

Lycomorpha pholus, Drury. *(Glaucopis pholus).* Not common. I have only taken it in one locality—a rocky ridge where lichens grow plentifully, about five miles from the city.

Note.—This arrangement of the *Zygænidæ* is in accordance with Packard's "Notes on the Zygænidæ" in Proc. Essex Ins., 1864.

MICRO-LEPIDOPTERA.

BY V. T. CHAMBERS, COVINGTON, KY.

Continued from Page 130.

LITHOCOLLETIS.

23.—*L. Cincinnatiella. N. sp.*

Face, palpi, under surface and legs silvery-white, the legs marked on their anterior surface with golden and brownish spots and bands: tuft, white, golden at the sides; antennæ silvery-white beneath, above golden brown faintly annulate with whitish: thorax and anterior wings bright

golden; upon the wings is a short snow-white median basal streak strongly dark-margined behind and within. (Sometimes the anterior margin and sides of the thorax are also white). Two snow-white fasciæ, one at about the basal ¼th, the other about the middle, both strongly dark-margined behind, and sometimes slightly so interiorly; and both strongly angulated posteriorly near the costa; with the first sometimes slightly interrupted at the angle, and the dark margin of the second posteriorly produced. A long oblique snow-white dorsal streak at the base of the dorsal ciliæ posteriorly dark-margined, and a smaller costal one a little behind it at the base of the costal ciliæ, similarly dark-margined. This dorsal streak is sometimes posteriorly produced, and confluent with a straight dorso-apical streak, which is faintly dark-margined behind, but is sometimes entirely wanting. When present it forms the interior border to the apical dusting. Sometimes the costal streak is produced so as to be confluent with it also, and opposite to it there is sometimes a costo-apical white spot which is separated from it by the apical dusting, which extends thence to the apex and is black upon a white ground. Hinder marginal line in the ciliæ dark brown. Ciliæ golden. *Al. ex.* ¼ to ⅓ inch. Kentucky. Wisconsin. One of the commonest and prettiest species. The larva mines the leaves of White Oaks. (*Quercus Alba* and *Q. obtusiloba*), and sometimes there are several mines on the same leaf. It mines the upper surface. There are always several larvæ in a mine, and this is the species of which (as stated *ante* p 55) I have counted fifteen small larvæ in a single small mine. The mine is *brownish-yellow* and spreads frequently over a large part of the leaf, and may thus be distinguished from the *whitish* mine of *L. hamadryadella* which sometimes is found upon the same leaf with it. The young larvæ lie packed together side by side in the mine in a curve or crescent, and the mine for some distance shows a series of concentric curves gradually enlarging as the larvæ grow. The frass is scattered. The older larvæ scatter, and usually most of them leave the mine and perish. It is much preyed upon by spiders, which, I believe, from various circumstances (though I have not caught them *flagrante delicto*), tear open the mines and eat the larvæ. The same thing happens to various other species of larvæ. The mines of this and many other species are also much infested by a black species of Thrips. What its business in them is, I have not ascertained. Various mites are also found in them. This species passes the winter in the larval condition and forms its pupa in a flat thin cocoon or web in the mine, becoming a pupa in April, and the imago emerging in about ten

days. The larva is flat, whitish; head and sides of the first segment yellowish. Maculæ very indistinct and pale yellowish. All of the larvæ that I have examined this summer were of this character except in one mine, where with several flat larvæ there was one *dead cylindrical* one. My recollection, however, is very distinct that the first mine that I opened and which was gathered in March from a tree on which it had hung all the winter, contained two pupæ and four *cylindrical* larvæ, and the description in my notes made at the the time confirms my recollection. These four larvæ became pupæ, and I have now by me the imagines which I bred from them, and I can not conceive how my eyes could have deceived me so as to mistake a flat larva for a cylindrical one. Yet I am loath to believe that there are two larval forms in the species, although it is well known that there are two in the genus.

† † *Without fasciæ, but with dorsal and costal streaks.*

24.—*L. Argentinotella* Clem. *Loc. cit. sup.*, p. 325.

Dr. Clemens describes the imago of this handsome species, but says that he can give no account of its larva, or food plant. I have bred it from a tent mine on the under side of Elm leaves *(Ulmus Americana)*. The larva is cylindrical and yellowish.

All of my specimens have the white line on the anterior margin of the thorax extended back over the tegulæ, and confluent with the basal streak. Dr. Clemens does not mention these markings of the thorax, but they are so variable in many species—sometimes present, sometimes absent—that I have no doubt of the identity of my specimens with that described by Dr. Clemens, as they agree in all other respects, and I have never met with any species which might be mistaken for it. *Alar. ex* ¼ *in.* Kentucky and Pennsylvania. Common.

25.—*L. basistrigella* Clem. *Loc. cit. sup.*, p. 321.

There is some variation in the disposition of the apical dusting, and sometimes it is nearly wanting, and frequently the first dorsal streak does not quite attain the dorsal margin and is not produced to the base of the wing. *Alar. ex.* ¼ to nearly ⅓ in. The larva is cylindrical and makes a tent mine between two veins on the under side of the leaves of White and Chestnut Oaks *(Q. alba* and *bicolor* and *prinoides)*. Common. Kentucky and Pennsylvania.

26.—*L. Ulmella. N. sp.*

Face and palpi silvery-white, tuft white intermixed with golden. Antennæ silvery-white, the apical two-thirds annulate with brownish.

Legs and under surface silvery-white. Anterior wings bright golden, inclining to orange, with a white streak along the dorsal margin from the base to the ciliæ, where it is deflexed and passes on to the dusted portion of the apex which is near the posterior margin, and is dark brown on a white ground. There are three small costal silvery streaks, the first and second being near the middle of the costal margin, and the second one the largest, while the third is small and near the apex. There is some variation in the size of the third costal streak and in the extent of the apical dusting, and sometimes the costal streaks are faintly dark-margined. The abdomen and legs are very pale-golden varied with white. *Alar. ex.* ¼ to nearly ⅓ in. Two specimens, taken at Columbus, Georgia, were so much larger than my Kentucky specimens that I was inclined to regard them as specifically distinct, but they were so much injured before I had an opportunity to compare them with my Kentucky specimens, that I can not be certain; the smaller specimens (♂?) are more distinctly marked than the larger. The larva is flat and makes an irregular blotch-mine, with scattered frass, in the upper surface of the leaves of *Ulmus Americana*. It resembles closely the larva of *L. Cincinnatiella*, but it is more greenish, whilst the imago resembles *L. basistrigella* somewhat, which has a cylindrical larva.

HINTS TO FRUIT GROWERS.

PAPER NO. 4.

BY W. SAUNDERS, LONDON, ONT.

ATTACUS CECROPIA.—During the winter months, when the apple trees are leafless, the large cocoons of the *Cecropia* moth may be found here and there, firmly bound to the twigs, and occasionally I have seen them on young trees attached to the stock near the ground. They are about

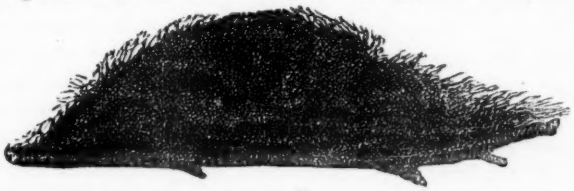

FIG. 31.

three inches long, pod-shaped (see fig. 31), and of a dirty brown colour,

and are entirely constructed of silk, the fibres of which are very much stronger than those of the common silk worm *Bombyx mori*. This silk has been worked to a limited extent and manufactured into socks and other articles, which have been found very durable; but a drawback to the advancement of this branch of industry lies in the fact that the caterpillars do not bear confinement well, and hence are not easily reared.

The exterior structure of the cocoon is very close and papery-like, but on cutting through this, we find the interior—surrounding the dark brown chrysalis—made up of loose fibres of strong yellow silk. This snug enclosure effectually protects the insect in its dormant state from the extremes of weather during the long wintry months. When the time approaches for the escape of the moth, which is about the beginning of June, the internal dark brown chrysalis is ruptured by the struggles of the occupant, and the newly born moth begins to work its way out of the cocoon. As it is possessed of no cutting instrument of any kind, this would indeed be a hopeless task had not the all-wise Creator made a special provision for this purpose, and to this end a fluid adapted for softening the fibres is furnished just at this juncture and secreted from about the mouth. On listening to the creature as it works its way through, you hear a scraping, tearing sound, which is made by the insect working with the claws on its fore-feet, tearing away the softened fibres and packing them on each side to make a channel for its escape. The place of exit is the smaller end of the cocoon, which is more loosely made than any other part and through which, after the internal obstacles are overcome, the passage is effected without much further trouble.

I have frequently watched their escape. First through the opening is thrust the anterior pair of bushy looking legs, the sharp claws of which fasten on the outside structure; then with an effort the head is drawn forward, suddenly displaying the beautiful feather-like antennæ; next, the thorax, on which is borne the other two pairs of legs, is liberated, and finally, the escape is completed by the withdrawal of the abdomen, through the orifice thus made. Queer looking creatures they are when they first put in an appearance, with their large, fat, juicy bodies, and tiny wings. When the wings are fully expanded they measure from five to six inches or more across, but when fresh from the chrysalis they are but very little larger than the wings of a bumble bee. The first necessity now for the welfare of the individual is to find a suitable location where the wings may be held in a good position for expanding, for without such favorable

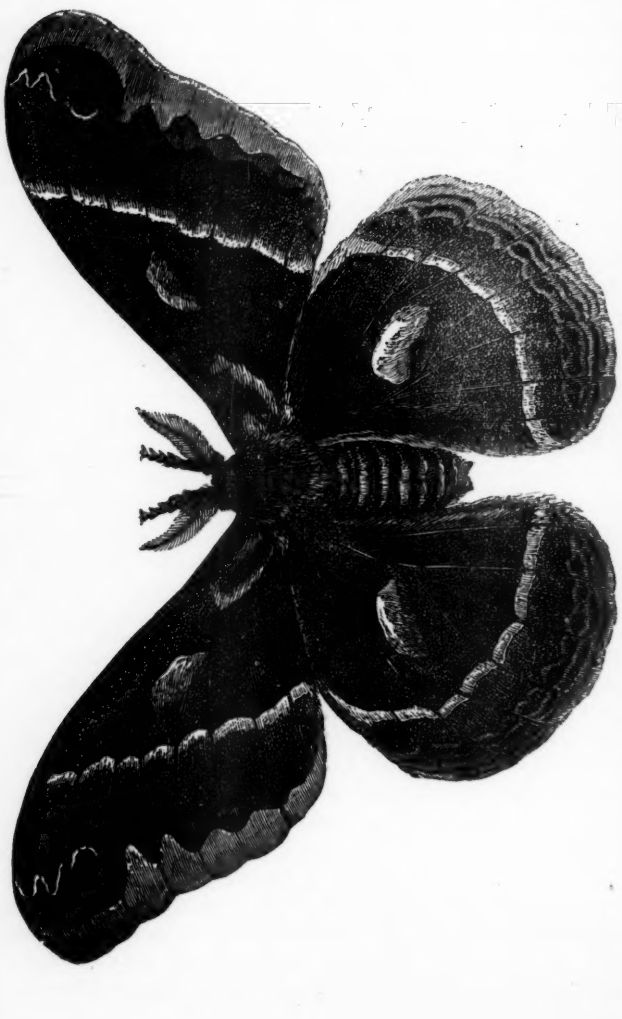

Fig 32. ATTACUS CECROPIA—*Male.*

circumstance they would never attain a serviceable size. It is necessary that a position should be secured where the wings may hang down as they are expanding, for which purpose the under side of a twig is often selected; and here, securely suspended by the claws, the wings undergo in a short time the most marvellous growth it is possible to imagine. The whole process, from the time of the escape of the moth to its full maturity, seldom occupies more than from half an hour to an hour, and during this time the wings grow from the diminutive size already mentioned to their full measure and capacity.

A wing clipped from the insect immediately after its escape, and examined under the microscope, reveals the fact that the thousands and tens of thousands of scales with which the wings are covered, and which afterwards assume such beautiful feather-like forms, are now nearly all threadlike, not folded up or wrinkled, but undeveloped. Impressed with this thought, the mind is fairly astonished at the almost incredible change wrought in so limited a time, for the growth embraces not only the extension of the surface of the wing, but the enlargement and maturity of every scale or feather on it, the individuals of which are but as dust to the naked eye. What a wonderful and intricate system of circulation and power of nutrition must be possessed to accomplish this marvellous result!

Fig 32. ATTACUS CECROPIA—*Male.*

As some of our readers may not be familiar with the appearance of this our largest moth, we append a figure of it. (See fig. 32). Soon after their exit these moths seek their mates, and after pairing, the female begins to deposit her eggs, a process which occupies some time, for the eggs are not laid in patches or groups, but singly; and are firmly fastened with a glutinous material to the under side of a leaf; and as it is seldom there are more than one or two laid on any single tree or bush, a considerable distance must be traversed by the parent in the transaction of this all-important business.

Until the present season, I never had an opportunity of fairly computing the number of eggs which one of these moths will lay, and had roughly estimated them in my own mind at from 50 to 100. About the first of June, a pair of *cecropias* came into my possession, and afforded a favourable opportunity of throwing light on this point. On the 3rd of June, the female began to deposit eggs, which she continued to do at intervals until the 6th, and in a few days afterwards, died. On counting the eggs I found them to number 217. When we consider the relative size —for they are large—it may readily be imagined, that the size of the body of the moth, was much reduced upon the completion of her task. The

egg is about one-tenth of an inch long, nearly round, and of a dull creamy white colour, with a reddish spot or streak near the centre. The exact duration of the egg stage was not noted, but may be set down as probably from a week to ten days.

At the expiration of this period, the larva eats its way out of the egg, the empty shell of which furnishes the young thing with its first meal. At first it is black, with little shining black knobs on its body, from which arise hairs of the same colour. Being furnished with a superior appetite, its growth is very rapid; and from time to time its exterior coat or skin becomes too tight for its comfort, when it is ruptured, and thrown off. At each of these changes or moultings the caterpillar appears in an altered garb, gradually becoming more like the full-grown larva represented in the accompanying figure. (See fig 33.) It is very handsome. Its body is

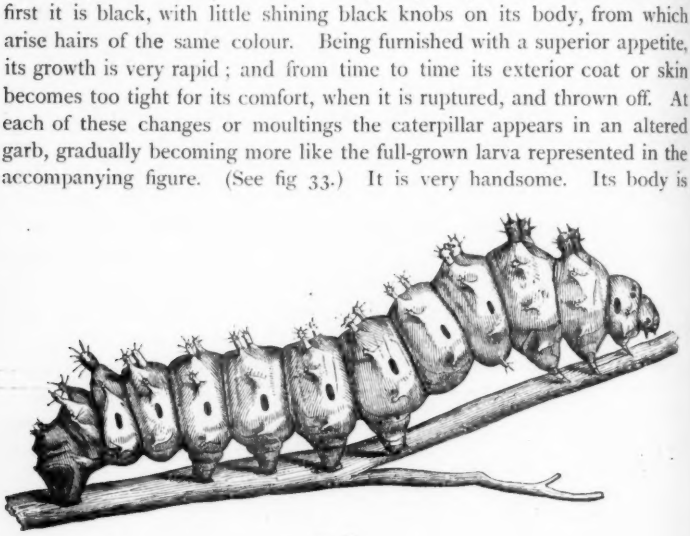

FIG 33.

pale green, the large warts or tubercles on the top of the 3rd and 4th segments are coral red, the remainder are yellow excepting those on the second and terminal segments, which, in common with the smaller tubercles along the sides, are blue. During its growth from the diminutive creature as it escapes from the egg, to the monstrous-looking full grown specimen, it consumes an immense amount of vegetable food; and especially as it approaches maturity, is this voracious appetite apparent. Where one or two have been placed on a young apple tree, they will often strip it entirely bare before they have done with it, and thus prevent the proper ripening of the wood, entailing damage to the tree and sometimes endangering its life; hence, during their season, they should be watched for and destroyed. Now that their period of active labor is over, their

cocoons may be looked for, and removed in time to check their further increase. In the caterpillar state they are not of dainty appetite, and, while partial to the apple, will eat other foliage as well; were it not so, we should soon hear more of their destructive effects. We have taken them feeding on cherry, plum, maple, willow, lilac, black and red currant, and hazel, and they are said to attack also the hickory, birch, elm, honey locust, barberry, hawthorn, and elder.

The natural increase of this insect being so great, a wise provision has been made to keep it within bounds. Besides enemies which attack the egg, and young larva, there are several parasites, which live within the body of the caterpillar and destroy it before reaching maturity; and in this way, their numbers, which would otherwise soon be alarming, are kept within moderate limits.

INSECTS OF THE NORTHERN PARTS OF BRITISH AMERICA.

COMPILED BY THE EDITOR.

From Kirby's Fauna Boreali-Americana: Insecta.

(Continued from page 137.)

[103.] 145. OICEOPTOMA [SILPHA] AMERICANUM *Linn.*—Length of body 8½ lines; breadth 7 lines. Taken in Nova Scotia by Capt. Hall.

Body very much depressed, thickly punctured with a hair issuing from each puncture; on the under-side black. Head with a round impression between the eyes: prothorax pale-yellow with a subquadrangular sublobate black spot in the disk; punctures of the prothorax very thick, those of the discoidal spot resembling scratches: elytra brown-black, rather silky, with two longitudinal, undulated, obsolete ridges that do not reach the apex; their surface is covered with irregular elevations, and near the suture is a series of punctiform impressions; epipleura very wide with its horizontal portion resplendent with a lustre between bronze and gold, vertical part, or inner margin, yellow; the suture of the elytra terminates in a minute point. Olivier says there are three ridges on the elytra, but only two are discernible in the specimen here described. It is singular that no author has noticed the brilliant side-covers of the elytra. [Synonymous with *S. peltata* Catesby. Common in Canada; north shore of Lake Superior (Agassiz).]

146. Oiceoptoma [Silpha] terminatum *Kirby*. — Length of body 9¼ lines. Taken in Nova Scotia by Capt. Hall.

This species seems nearly related to *O. Americanum*, but it is narrower in proportion to its length, the front has a distinct oblong impression; the elytra are yellow at the apex and acuminate, which last is probably a sexual character; the epipleura is less brilliant than in the preceding species, and the elytra are not silky. In other respects it resembles it and may possibly be the female. [A variety of *Silpha peltata* Catesby; taken at Toronto by Mr. Couper.]

147. Oiceoptoma [Silpha] affine *Kirby*.—Length of body 9 lines. Taken in Nova Scotia by Dr. Mac Culloch.

Very like the preceding species, but the frontal impression is smaller and round: the discoidal black spot of the prothorax is smaller, with the lateral lobes rounded, and with round confluent punctures: the horizontal part of the epipleura is black with a slight tint of blue, and not at all bronzed. [Also a variety of *S. peltata*. Taken at Toronto by Mr. Couper; and on north shore of Lake Superior by Agassiz's Expedition.]

MISCELLANEOUS NOTES

On the Swarming of Danais Archippus.—On the first day of September, while driving along the Lake Shore Road, on the borders of Lake Erie, a mile or two south of Port Stanley, I was favoured with a sight which will not soon be forgotten. For several days previous, *Archippus* butterflies had been unusually abundant, and early in the morning of the day in question, some groups—numbering probably hundreds of individuals—which had rested during the night on trees adjoining the hotel at Port Stanley, were gyrating in a wild manner at all heights, some so far up that they appeared but as moving specks in the sky, others floating lower, over the tops of the trees, in an apparently aimless manner. This was, however, as a mere skirmishing party when compared with the vast hosts seen a little later.

It was about nine o'clock in the morning when, passing a group of trees forming a rude semicircle on the edge of a wood facing the lake, the leaves attracted attention: they seeming possessed of unusual motion, and displayed fitful patches of brilliant red. On alighting, a nearer

approach revealed the presence of vast numbers — I might safely say millions—of these butterflies clustering everywhere. I counted a small space, about the size of my two hands, on one of the trees, and there were thirty-two butterflies suspended on it, and the whole group of trees was hung in a similar manner. When disturbed, they flew up in immense numbers, filling the air, and after floating about a short time, gradually settled again. There appeared to be nothing on the trees to attract them, yet when undisturbed they appeared at this time, to prefer resting in quiet, as if enjoying the presence of congenial society. I regretted not having a net with me, as I should like to have captured a number of them to see in what proportion the sexes were represeted in the company. Their food plants—the various species of *Asclepias*—did not appear to be unusually common in that section. I apprehended that many of the individuals must have travelled some distance to be present at this gathering. The fact that the larva of *Archippus* is but seldom affected with parasites may partially account for their occasional abundance; I only know of one small ichneumon infesting them, and have seldom met with this.

W. Saunders, London, Ont.

Abundance of D. Archippus in Massachusetts.—I wish to call attention to the fact that *Danais archippus*, Fab., is exceedingly common all over New England this season. It is well known that many species of our butterflies have a year of great abundance, and then are almost unknown for quite a series of years. The cause of this is usually attributed to a scarcity of insect enemies, and a favorable season for their food. This abundance of a species is a sufficient reason for the multiplication of parasitic enemies, which increase to the point of almost total extermination of the species attacked, as well as themselves. Two years ago, *Cynthia cardui* was very abundant, and I obtained over one hundred larvæ, not one of which could I raise on account of a parasitic fly-larvæ which were so abundant as to lack food for their own maturity, practically exterminating one another. Since then I have not seen a single *cardui*. Whether the parasitic fly is common I am unable to say. I am confident that to some extent the above is true of many species, but *D. archippus* never has to my knowledge any enemies, for this year I have raised abundance of larvæ and taken many chrysalids; but all were sound. Therefore we must hunt for some other cause of their disappearance. Perhaps others more interested in Lepidoptera than myself may have gathered facts which will throw light upon this subject, and to draw out these experiences induces

me to write this note. My little son has found a parasite in the chrysalis of *Pieris rapae*, Sch., which I will report on as soon as worked up.

PHILIP S. SPRAGUE, Boston, Mass.

COCOONS MADE BY SNOUT-BEETLES.—I was sorry to find, upon glancing over my late communication that, as it appears on page 118, I have in my haste made too sweeping an assertion in stating that "*Curculionidous* larvæ do not spin silken cocoons," (lines 16 and 17). I know of none in this country which have any such power of spinning, and this is so very generally the case with the family that it may almost be stated as a rule. Yet, Westwood in his *Introduction* mentions, on other authority, several instances of such spinning, some of which I am inclined to think must be taken *cum grano salis*. It will be well to instance them, however. On page 337 (Vol. II.) he speaks of the perfect female of *Rhynchites bacchus*, Linn., as lining her nidus with silk, yet from the writings of Kollar, Nordlinger, Boisduval and others, we may learn that this nidus is simply closed with a glutinous substance, and whether secreted from the mouth or anus does not appear so clear. Again, on page 341, mention is made of an undetermined species which in the larva state draws the clusters of apple blossoms together by means of a web. This is on the authority of *Salisbury on Orchards*, which I cannot consider very trustworthy. But on page 343 we find sufficiently authentic notices of cocoons spun by larvæ belonging to the genera *Hypera* and *Cionus*, and by another weevil named *Curculio pimpinellæ:* my statement should, therefore, be qualified.

C. V. RILEY.

ARTIFICIAL COLOURING OF LEPIDOPTERA.—At a recent meeting of the Entomological Society of London, (England), Mr. Butler exhibited species of Lepidoptera, upon which experiments had been made by Mr. Meldola, with regard to testing the effects of dyes. The insects were *Pieris brassicæ* and *napi*, *Gonopteryx rhamni*, *Vanessa urticæ*, *Pyrameis Atalanta* and *Arctia caja*. The most striking effects were observable in *P. napi* dyed black, and *A. caja* dyed metallic-green and magenta. The dyes used were aniline. Mr. Meldola dissolved the dyes in spirits of wine and laid them on with a camel-hair pencil. Not being satisfied with Mr. Meldola's experiments, Mr. Butler resolved upon performing others on his own account; but being then ignorant of the system pursued, he dissolved his dyes in hot water, and discovered that the specimens would not take them. He then made a solution of soda, into which he dipped *G. rhamni*, and found that the yellow pigment immediately united with

the soda, and was discharged into the solution, which it visibly coloured, and he saw no reason why, if a sufficient number of individuals were experimented upon, the colour should not be collected and utilised. *Colias Edusa* and *Hyale*, *Danais Chrysippus* and *Vanessa urticæ*, were deprived of their natural colours in the same manner. Mr. Butler had experimented upon *G. rhamni* (dyed blue), *C. Edusa* and *Hyale*, *Papilio Demoleus*, *Lycæna Corydon*, *Danais Chrysippus*, *Argynnis Adippe* and *Aglaia*, *Vanessa urticæ*, *Epinephele Janira*, *Arctia caja* and *villica*. The most successful results were obtained with *Danais Chrysippus*, deprived of its natural colours and dyed blue, which colour only entered certain scales, whereas magenta, being a faster dye, entered all: and *V. urticæ*, dyed blue in one case, and magenta in another; the latter resembled a typical South-African *Junonia*, the former a melanitic variety of the same species. The peculiarity in these specimens consisted in certain parts of the wings not taking the dye, leading to the conclusion that the scales are more perfectly closed in these parts.

Mr. Meldola (who was present as a visitor) remarked that he had also made experiments with alkalies; the yellow of *G.rhamni* being removed by soda, and precipitated by the addition of an acid. He possessed an example of *Vanessa Io* altered to deep mahogany-colour by exposure to the fumes of ammonia.

Mr. Bicknell exhibited a number of examples of *Gonopteryx rhamni*, upon which he had experimented with cyanide of potassium, as suggested at the last meeting. The yellow was changed to orange-red in the parts exposed to the cyanide.

Mr. F. Smith stated that he had seen a number of wasps that had been killed by cyanide of potassium, and which, in consequence, were changed to vermilion.

The hope was expressed that these interesting experiments would not be taken advantage of by unscrupulous persons, in consequence of the prevailing disposition to pay high prices for varieties of common Lepidoptera.—THE ZOOLOGIST.

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THE undersigned would be pleased to correspond with Lepidopterologists (Southern and Western U. S. preferred), with a view to exchanges. Address EDW. L. GRAEF, 40 Court St., Brooklyn, N. Y., U. S.

LEPIDOPTERA, &c.—I have a collection of Birds' Eggs, Lepidoptera (including some from Florida) and Coleoptora, duplicates of which I should like to exchange, giving preference to the two first named.—JOSEPH E. CHASE, Lock Box 46, Holyoke, Mass.

An American Entomologist, who has made a speciality of Lepidoptera, would like to correspond with collectors in any part of the world.—Address H. K. Morrison, care of E. K. Butler, 68, Pearl-street, Boston, Mass.

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